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ABSTRACT

Very little is known about the conditions under which young children acquire strategic means of remembering in natural learning environments. A promising line of research attributes the emergence of "internal remembering strategies" to formal schooling environments. Data gathered from 173 children in kindergarten through the third grade indicated that types of environmental differences perceived by the children were consistent with some of the causal dimensions proposed by schooling theorists. However, increasing evidence of strategic study and retrieval behavior in preschool children point up the limitations of schooling hypotheses. It is difficult to know how frequently and in what ways adults direct instructional activities to everyday memorization tasks with preschoolers, or how systematic and persistent adults are in attempting to gradually transfer remembering responsibilities and strategy usage to their children. Research suggests that while mothers often refer to and demonstrate the use of adult-like strategies for remembering, they seldom persist in requiring the child to use the strategy to self-regulate recall. Nevertheless, even 2- and 3-year-olds are taught and expected to remember to perform simple recurring and prescheduled activities on a daily basis. Such experiences undoubtedly afford young children at least a rudimentary means-goal understanding of the recall function and may account for some of the strategy knowledge and use found in primary school students. (RH)

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Instructional Formats Associated with the Development of Strategic Remembering

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Instructional Formats Associated with the Development of Strategic Remembering

Despite nearly two decades of research relating developmental improvements in recall proficiency to children's increasingly deliberate study and retrieval behaviors, and some extensive analyses of task and training conditions under which children are more and less likely to produce mnemonic strategies in experimental settings (e.g., those included in the Pressley & Levin volumes, 1983), we know very little about the conditions under which young children acquire strategic means of remembering in natural learning environments.

There are, however, several lines of research that look to be promising in this regard. That which has received the most attention attributes the emergence of "internal remembering strategies," (those involving references to internal cues and storage such as verbal rehearsal and mature category organization) to formal schooling environments. Schooling explanations not only account for the age at which these strategies appear, but they specify some of the experiences and demands that children encounter routinely at school which may account both for the child's need and ability to use strategic means of remembering. Cole and Scribner's (1977) emphasis on the abstractness, difficulty and distancing requirements of materials and tasks encountered at school, and Stevenson et al (1978) emphasis on the school's role in teaching cognitive performance skills requiring

deliberate self regulation (e.g., those associated with carrying out instructions and attending to stimuli) are good examples.

But, as reasonable as these "schooling hypotheses" are, there is actually very little research affording direct comparisons between children's instructional experiences at school and those at home. With this question in mind, Saralyn Griffith and I set out to ask children to tell us about differences they perceived between home and school environments through an interview study. The study included 173 children in the early elementary grades, i.e., K, 1, 2, and 3, representing a cross section of socioeconomic, racial, and ethnic groups. We also obtained a great deal of mail-survey data from the children's parents and teachers which will not be cited here. The children's interview schedule included forced-choice questions bearing on (1) the types and experiential relevance of knowledge children purport to have to memorize at home and at school, the extent that children claim to receive direct instruction for adult-like memorization strategies at home and school, and purport to be tested and rewarded for successful memorization; and (3) the extent that children perceive home and school environments to call for independent and exacting task performance--conditions likely to contribute to the early development of motives for remembering information which is unrelated to the child's immediate needs and experiences. For

each question, the child was asked to make a categorical decision as to whether an experience or behavioral requirement occurred more often at home or at school by pointing to a picture of a house for an "at home" answer, or to a picture of a school for an "at school" answer.

We were well aware of the circumstantial nature of the study. Our reasoning was that if schooling environments do in fact, contribute significantly to the onset of mature memorization strategies, they should be distinguishable to young children on at least some of the dimensions tapped by the interview instrument. While we were quite deliberate ourselves in constructing items that we though might best distinguish these environments in the minds of the children, we nonetheless were surprised with the consistency of the children's responses to many of the questions. Table 1 includes 22 instances of

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Insert Table 1 about here

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knowledge--some of which were prejudged to be concrete, relevant and meaningful for the child's everyday experiences and activities (i.e., "home predictions"), and others of a more symbolic nature presumed to have less relevance to children in the here-and-now (i.e., "school predictions"). Each of these questions was prefaced with the phrase, "Where do you have to learn and remember . . .?" As can be seen, the predictions hold up rather well, although slightly better for the younger children. The interview

included several additional questions bearing on the experiential relevance of learning contents at home and school which do not appear in the table. Comparable percentages of children selected "at home" and "at school" when asked directly about the concreteness of their learning experience, i.e., where do you get a chance to touch and pick up things when you are learning about them? However, reliably higher percentages of younger and older children responded "at home" when asked where do you learn things that you can do everyday when you are by yourself?, and reliably higher percentages of children responded "at school" when asked where do you often learn about things that you have never seen or heard before?, and where do you learn things that you will need to know when you grow up?

Another set of questions focused on the extent of testing, teaching and rewarding for successful memorization occurring in the home and at school. As shown in Table 2, reliable majorities of younger and older children responded "at school" when asked

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Insert Table 2 about here

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where they are told to use verbal rehearsal, stimulus grouping, stories and rhymes, and tricks and strategies to make remembering easier. The children's versions of tests and rewards questions were: Where are you checked up on or tested to see if you can remember what you are supposed to? Where do you get a reward or are told that you've done very well when you have remembered what

you are supposed to? Where are you told beforehand that you will be checked up on . . . etc.? Reliable majorities of older children responded "at school" for all but one question, i.e., pre-knowledge of ensuing rewards, and reliable majorities of the younger children responded "at school" for all four questions.

The final series of questions focused on the extent that children associate home and school environments with independent and exacting cognitive performance requirements. The children's questions were prefaced with Where do you have to . . . and were completed as follows: Listen more to what is said to you when you are learning? be more careful when learning the things that you are supposed to? think harder about what you are trying to learn? be sure that you are learning something the right way? think by yourself about how to learn something before you start to try to learn it? keep a lot of things in your head at the same time when you are trying to learn something new? As shown in Table 3, reliable majorities of children responded "at school" to all questions.

Insert Table 3 about here

While these macro-level findings fall far short of the kinds of evidence needed to verify causal links between formal schooling experiences and cognitive performance changes, the types of environmental differences perceived by the children are

consistent in our minds with some of the causal dimensions proposed by schooling theorists. Perceptions that school imposes more rigorous demands for independent and exacting task performance, coupled with what appears to be a greater emphasis on the memorization function and greater encouragement to use efficient means to study and remember materials, are factors likely to contribute significantly not only to knowledge of remembering strategies, but as importantly, to remembering motives without which children would not refer to knowledge in a deliberate sense at all.

However, increasing evidence of strategic study and retrieval behavior in preschool children point up the limitations of schooling hypotheses. Baker-Ward, Ornstein and Holden (1984) have observed heightened visual examination and spontaneous naming of stimuli under recall instructions in children as young as four years, as have Wellman, Ritter and Flavell (1975) in their "missing dog" studies, and Wellman (1977) points up a number of examples of intentional and strategic behavior in younger children--demonstrating recently (1983) that even two-year-olds may rely on external cues in order to strategically remember something, e.g., to remind their mothers to purchase candy at a grocery store. While there are undoubtedly many approaches one might take to identify early experiential determinants of these behaviors, Rogoff's (c.f. Rogoff & Gardner, 1984) analyses of early forms of cognitive-strategy instruction in home environments would seem most promising.

Much of this research is based in the Vygotskyian view that children initially acquire cultural tools and practices through joint problem-solving activities with adults. The adult's role in these activities is to encourage the child, through a combination of explanation and demonstration, to extend current knowledge and skills to novel tasks and higher-order goals at a time when the child seems able to do so, i.e., in the "zone of proximal development." Rogoff refers to this process as the "social guidance of cognitive development," and argues that adult instruction is effective when it creates links for the child between familiar and novel problem contexts, and when it provides an external problem-solving structure, whereby, the adult defines and keeps track of the overall goal of a task, and segments it into manageable subgoals for the child to achieve.

It is difficult to know how frequently and in what ways adults direct these instructional activities to everyday memorization tasks with preschoolers, nor how systematic and persistent adults are in attempting to gradually transfer remembering responsibilities and strategy usage to their children--which is one of the adult functions that Rogoff & Gardner (1984) and Wertsch (1979) expound upon. Our own observations are limited to preshcoolers' adult-like behaviors in adult-like tasks, and indicate that while mothers often refer to and demonstrate the use of adult-like strategies for remembering when teaching their preschool children, they seldom persist in requiring the child to use the strategy to self-regulate recall.

Nevertheless, Wellman (1983) points out that even two- and three-year-olds are taught and expected to remember to perform simple recurring and prescheduled activities on a daily basis, e.g., brushing one's teeth before going to bed, and placing one's shoes where they can be found in the morning. Such experiences undoubtedly afford young children at least a rudimentary means-goals understanding of the recall function, and upon further description and analysis may well account for at least some of the task and strategy knowledge shown by the Kreutzer et al. (1975) kindergartners, and the simple remembering strategies used by younger children.

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Table 1*

Children's Perceptions of Selected Knowledge Instances Required for Memorization at Home and at School

Knowledge Types (Home Predictions)	Percentages of Children Responding in the Home and School Categories					
	At Home		At School		Home-School Effects	
	K-1 (n=82)	2-3 (n=91)	K-1 (n=82)	2-3 (n=91)	X^2 (n = 173)	p
Names of doctors and dentists	67	84	33	16	45.79	.001
Names of foods, drinks, and pieces of clothing	89	88	11	12	102.25	.001
Names of family members, friends, and neighbors	98	98	2	2	157.37	.001
Names of appliances, and tools	95	97	5	3	146.13	.001
Names of vehicles, machines, and tools	61	57	39	43	5.56	.018
Rules of games and sports	70	53	30	47	7.913	.005
Rules of conduct in parent's/ teacher's absence	65	66	35	34	16.24	.001
Rules of safety	45	45	55	55	1.67	.196
Rules for finding things needed and putting them back	41	53	59	47	.47	.494
Rules for using tools, utensils, and appliances	74	66	26	34	27.52	.001
Rules for caring for property	71	75	29	25	36.08	.001

*Data taken from Griffith & Lange (1985)

Table 1 (continued)

Children's Perceptions of Selected Knowledge Instances Required for Memorization at Home and at School

Knowledge Tests (School Predictions)	Percentages of Children Responding in the Home and School Categories					
	At Home		At School		Home School Effects	
	K-1 (n=82)	2-3 (n=91)	K-1 (n=82)	2-3 (n=91)	X^2 (n = 173)	p
Names of famous or historical cities and events	32	15	68	85	49.99	.001
Names of famous people in the news or in history	24	4	76	96	90.32	.001
Names of numbers and alphabet letters	4	0	96	100	161.21	.001
Names of cities, states, and countries	29	3	71	97	81.86	.001
Rules of arithmetic	4	0	96	100	161.21	.001
Rules of speech	6	4	94	96	138.87	.001
Explanations of body function	32	24	68	76	34.27	.001
Explanations of events in nature	50	21	50	79	16.24	.001
Explanations of mechanical function	38	13	62	87	43.75	.001
Contents of stories (themes, plots, and characters)	39	19	61	81	32.51	.001
Words of songs, poems, and sayings	41	11	59	89	44.11	.001

Table 2*

Teaching, Testing and Rewarding Successful Memorization at at Home and at School

Teaching, Testing, Rewarding (School Predictions)	Percentages of Children Responding in the Home and School Categories				Home School Effects	
	At Home		At School			
	K-1 (n=82)	2-3 (n=91)	K-1 (n=96)	2-3 (n=91)	X^2 (n = 173)	p
to repeat to self over and and over what is to be remembered?	38	28	62	72	21.51	.001
to memorize several things at a time?	37	40	63	60	9.72	.002
to memorize things in groups?	23	10	77	90	79.13	.001
to make up stories and rhymes to make remembering easier?	24	19	74	81	55.84	.001
to figure out helpful "tricks" or strategies for remembering ways to make remembering easier?	43	37	57	63	7.08	.008
checked up on or tested	1	1	99	99	165.09	.001
rewarded for successful memorization?	8	22	92	78	81.86	.001
told of ensuing tests?	12	8	88	92	111.68	.001
told of ensuing reward?	33	45	67	55	7.91	.005

*Data taken from Griffith & Lange (1985)

Table 3*

Children's Perceptions of the Requirements for Independent and Exacting Task Performance at Home and at School

Performance Behaviors (School Predictions)	Percentages of Children Responding in the Home and School Categories					
	At Home		At School		Home-School Effects	
	K-1 (n=82)	2-3 (n=91)	K-1 (n=82)	2-3 (n=91)	X^2 (n = 173	p
Listen carefully when learning.	1	1	99	99	165.09	.00
Do and learn things carefully.	15	16	85	84	81.86	.00
Think hard and concentrate on what is being learned.	6	1	94	99	149.83	.00
Be sure you have learned something correctly.	11	13	89	87	99.20	.00
Think about and work on something by yourself to learn it.	38	40	62	60	8.79	.00
Think about many things at the same time to learn something new.	13	2	87	98	124.91	.00

*Data taken from Griffith & Lange (1985)